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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,876	10/20/2003	Shanna D. Knights	130109.569C1	3902
500 7590 07/13/2007 SEED INTELLECTUAL PROPERTY LAW GROUP PLLC 701 FIFTH AVE SUITE 5400 SEATTLE, WA 98104			EXAMINER YUAN, DAH WEI D	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 07/13/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/689,876

Applicant(s)

KNIGHTS ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

**SUPPORTED CATALYSTS FOR THE ANODE OF A VOLTAGE REVERSAL
TOLERANT FUEL CELL**

Examiner: Yuan

S.N. 10/689,876

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July 5, 2007

Detailed Action

1. The Applicant's amendment filed on May 9, 2007 was received. Claims 16-21 were cancelled. Claims 10-14 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on January 9, 2007.

Claim Rejections - 35 USC § 102

3. Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Fung et al. (US 4,131,721).

Fung et al. teach a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the anode support. See Column 4, Lines 16-35. Fung et al. do not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Fung et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

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With respect to claims 11-13, Fung et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

4. Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Marchetti et al. (US 5,277,996).

Marchetti et al. teach a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the anode support. See Column 3, Lines 7-20. Marchetti et al. do not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Marchetti et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is *necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11-13, Marchetti et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

Claim Rejections - 35 USC § 103

5. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) in view of Fung et al. (US 4,131,721).

Bregoli et al. discloses a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the cathode support. See Column 3, Line 65 to Column 4, Line 7. Bregoli et al. do not teach the use of the graphitized carbon as the anode support. Fung et al. teach the graphitized carbon is particularly suited for long-term use as cathode electrode. Nevertheless, it may also be used as anode electrode. See Column 4, Lines 16-31. Therefore, it would have been obvious to one of ordinary skill in the art to use the graphitized carbon as the anode support onto the fuel cell of Bregoli, because Fung et al. teach the graphitized carbon can be used as the anode support as well as the cathode support in a fuel cell.

Moreover, Bregoli does not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Bregoli et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11-13, Bregoli et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a

specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

6. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Fung et al. disclose a fuel cell as described above in Paragraph 3. However, Fung et al. do not specifically teach the BET surface area of the graphitic carbon is about $86 \text{ m}^2/\text{g}$. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5 to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface area of about $86 \text{ m}^2/\text{g}$, because Takai et al. teach a particular physical characteristic of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch*, CCPA 1980, 617 F.2d 272, 205 USPQ215.

7. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetti et al. (US 5,277,996) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Marchetti et al. disclose a fuel cell as described above in Paragraph 4. However, Marchetti et al. do not specifically teach the BET surface area of the graphitic carbon is about

86 m²/g. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5 to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface area of about 86 m²/g, because Takai et al. teach a specific surface area of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch*, CCPA 1980, 617 F.2d 272, 205 USPQ215.

8. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) and Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Bregoli et al. and Fung et al. disclose a fuel cell as described above in Paragraph 5. However, Bregoli and Fung do not specifically teach the BET surface area of the graphitic carbon is about 86 m²/g. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5 to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface of about 86 m²/g, because Takai et al. teach the physical characteristic of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum*

value of result effective variable in known process is ordinarily within skill of art. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

9. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Fung et al. teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 3. However, Fung et al. do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Fung et al., because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.

10. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetti et al. (US 5,277,996) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Marchetti et al. teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 4. However, Marchetti et al. do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in

performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Marchetti et al., because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.

11. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) in view of Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Bregoli and Fung teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 5. However, Bregoli and Fung do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Bregoli and Fung, because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.

Response to Arguments

12. Applicant's arguments filed on May 9, 2007 have been fully considered but they are not persuasive.

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Applicant's principal arguments are

(a) The graphitized carbon in Fung reference is serving as the anode, but not as a support;

(b) Marchetti reference does not disclose the use of graphitized carbon as the anode support as recited in claim 10.

In response to Applicant's arguments, please consider the following comments.

(a) In the instant specification, the carbon supported Pt/Ru catalyst composition is prepared by mixing the catalyst with the carbonaceous material. See page 39. Fung reference teaches the graphitized carbon is mixed with the electrocatalyst and binder to form the anode electrode. In essence, the electrocatalyst is supported on the graphitic carbon material, which is part of the anode structure;

(b) Marchetti reference teaches the electrode is composed of substantially planar adjacent layers. These layers include a carbon substrate layer such as graphitized carbon, an anchor layer composed of C₆₀ and a platinum layer serving as the catalyst. The platinum catalyst is supported on the graphitized carbon layer. The recitation "comprises" in claim 10 is an open language that could encompass additional layer in the anode structure.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

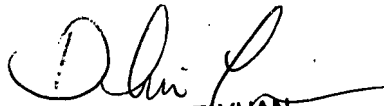
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
July 6, 2007



DAH-WEI YUAN
PRIMARY EXAMINER